THE EV Project

June 15, 2010

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Tucson Electric Power

A UniSource Energy Company

Electric Vehicles

Chevy Volt

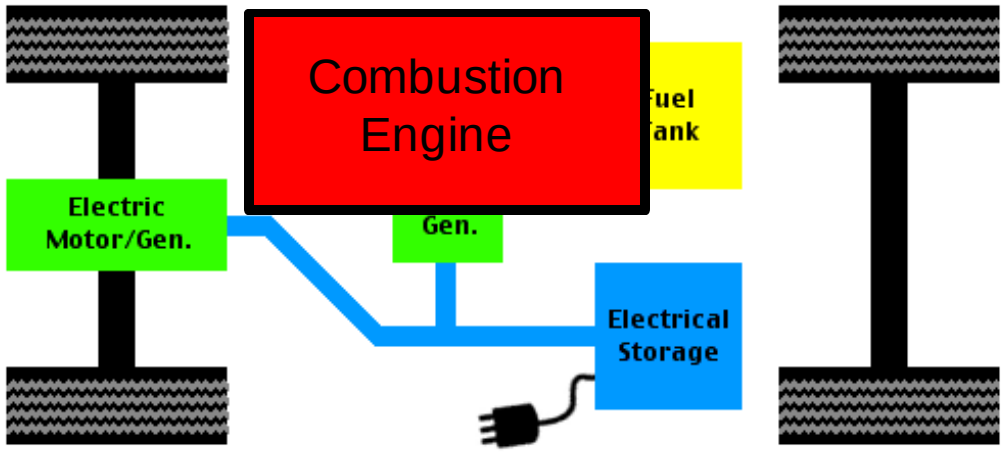
Ford Transit

Smith Line Truck

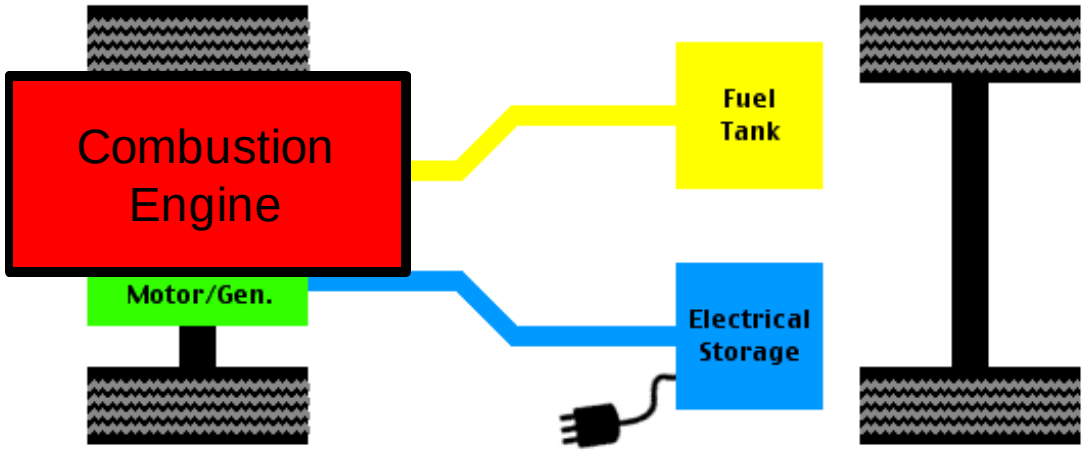
Tesla Roadster

Plug-in Hybrid Electric Vehicle

Series Hybrid
Example: Volt

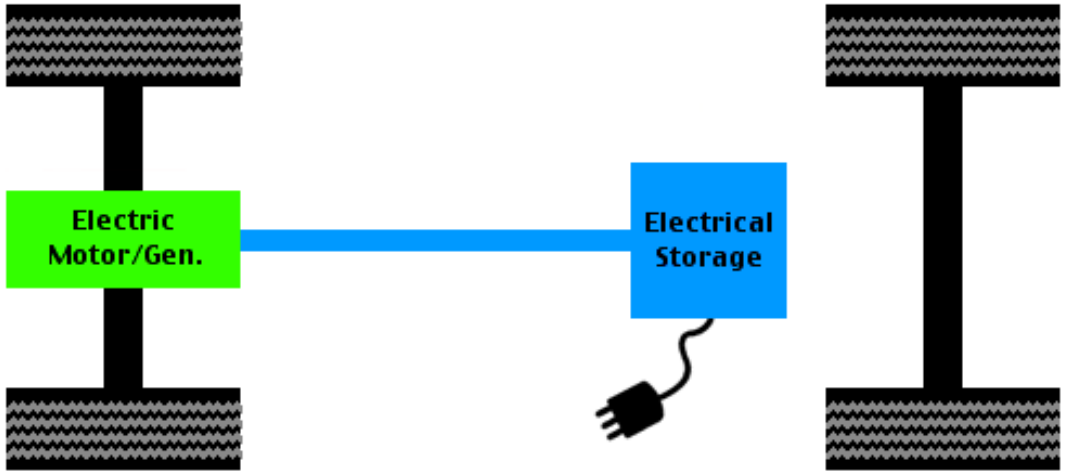


Parallel Hybrid
Example: Prius



Plug-in Electric Vehicle

Battery Electric Vehicle
Example: LEAF



-100 mile range
-Lithium ion battery 24kWh
-90 mph top speed
- Recycled materials
- GPS "distance to empty"

Consumer Benefits

- Zero emissions
- Reduced fuel costs
- No more gas stations
- Reduced maintenance
- Federal incentives
- Mobile technology

www.NissanUSA.com

Charging Stations

Level 1

– 110V, 16-18 hour charge

Level 2

– 220V, 4-8 hour charge

Charging Stations

DC Fast Charge

– 440V, 3-phase, 30 minute charge

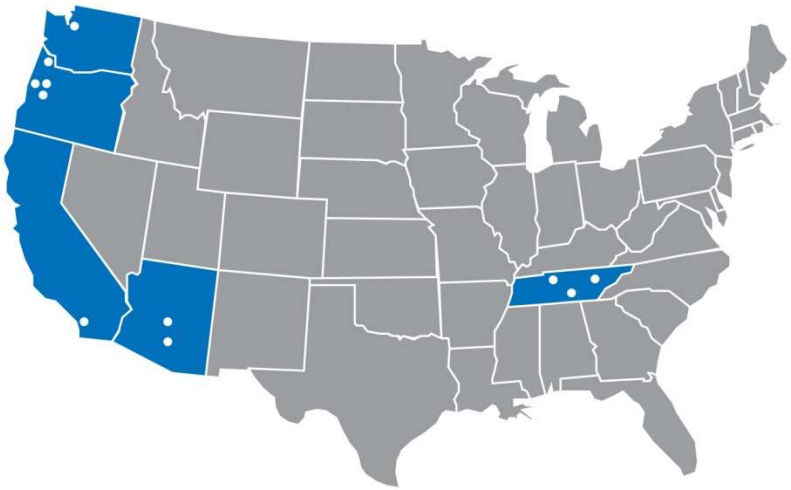
Getting Plug-in Ready

- System Impact
- Customer & Employee Education
- Micro-Climate Working Group
- Regulatory
- Charging Management
- Fleet Electrification

BRIGHT SOLUTIONS℠

EV PROJECT OVERVIEW

- **Project Markets**
  - Arizona (Phoenix and Tucson)
  - California (San Diego)
  - Oregon (Corvallis, Eugene, Portland, Salem)
  - Tennessee (Chattanooga, Knoxville, Nashville)
  - Washington (Seattle)
- **Project Funding**
  - $99.8 M DOE
  - **Approximately $200 M Total Project (**Private Sector Matching Funds)
- **Project Partners**
  - MAG - Maricopa Association of Governments/PAG – Clean Cites
  - SRP & APS
  - TEP



Charging Infrastructure Locations

- 2 million gallons of gasoline saved per year.
- 2.3 billion CO2e lbs. in five years.
- 27.1 billion CO2e lbs. in ten years.
- 750 New Jobs by 2012
- 5500 New Jobs by 2017

OBJECTIVES

- Deploy 4,700 Nissan Battery Electric Vehicles In 5 Regions
- Establish Mature Charge Infrastructure To Support Electric Vehicles
- Identify And Resolve Barriers To Infrastructure Deployment
- Develop An Infrastructure Utilization Data Base
- Evaluate Infrastructure Effectiveness
- Develop Models For Future Infrastructure Deployments
- Model Infrastructure For The Next 5 Million Vehicles

INFRASTRUCTURE DEPLOYMENT

- Electric Vehicle Supply Equipment (EVSE) Designed And Manufactured To Allow Power And Energy Data Collection And Demand Response Control
- Residential EVSE Installed For All Vehicles
- 1,300 Commercial EVSE Deployed In Each Region
- 150 Public EVSE Deployed In Each Region
- ≈ 50 DC Fast Charge Ports Deployed In Each Region
- Data Collected From All Chargers Via Internet
- Infrastructure Data Base Maintained And Analyzed At Idaho National Laboratory

OVERALL SCHEDULE

Contract	09/30/09
EV Micro-Climates©	Q2 2010
Initial Infrastructure	Q3/2010
Vehicle Launch	12/2010
Final Infrastructure	Q2 2011
Evaluation	Q4 2010 – Q3 2012
Reporting	Quarterly
Completion	Q2 2013

Hardware Deployment

	National	Arizona
Level 2 Residential	4700	900
Level 2 Commercial	5500	1000
Level 2 Public	750	150
L3 City	210	40
L3 Corridor	50	10

1. National Partners
2. Municipal Locations
3. Regional Businesses
4. Residential

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How will participating LEAF owners be selected for The EV Project?

LEAF Retail/Fleet Participation

- Total of 900 LEAFs
- Requirements
  - Ideally 600-800 miles per month
  - Broadband Internet service
  - Live, work or mission within Project boundaries
  - OK to send usage data
  - OK to talk to researchers
  - Cost effective installation

Free home base charging system installed for qualifying participants.

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Level 2

208-240 Volt **40 Amp**

50% Charge – 3-5 hrs

Standardized

DC Fast Charge Stations

0% to 80% charge in 26 minutes

50% Charge 10-15 minutes

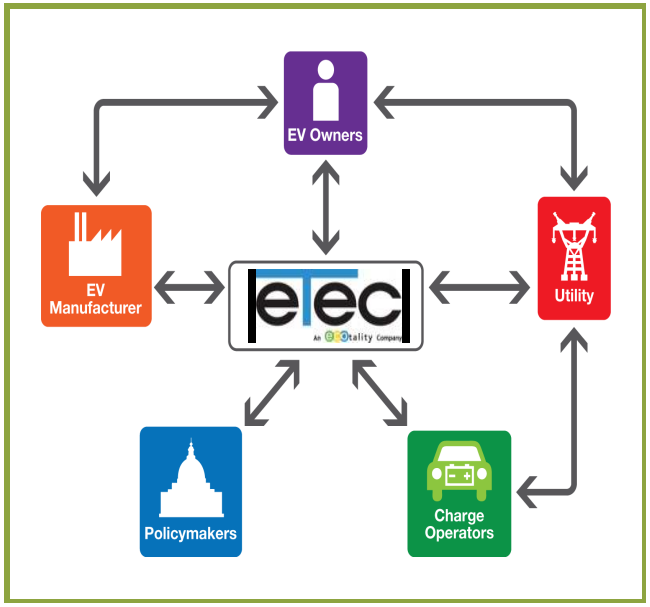
20-30 miles per 10 minutes

Input Voltage: 200 – 250 VAC 3-Phase or 380 – 575 VAC 3-Phase

Infrastructure Planning

1. Develop EV Infrastructure Deployment Guidelines with localized content (Completed!)
2. Educate Stakeholders on EV Infrastructure Requirements
3. Develop 10-Year Plan
4. Develop Roadmap (Locations)

EV Micro-Climates©



EV Infrastructure Deployment Guidelines By March 2010

A. Reviewed by Local Technical Advisory Team

B. Includes local requirements for:
   - Permitting
   - Accessibility
   - Signage
   - Point of Sale
   - Utility Interface

C. Guidelines Workshops for Stakeholders

D. Version 3.0 (Final)
   - Incorporates Stakeholder Input

EV Micro-Climate Plan & Roadmap

By July 2010

- **Develop EV Micro-Climates© Plan**
  - **Project Boundaries**
  - **Incorporates Local Demographic and Transportation Studies**
  - **Survey of existing EVSE**
  - **10-Year EV Infrastructure Feedback**
    - **Incorporates Stakeholder Feedback**

EV Micro-Climate Plan & Roadmap

By July 2010

- **Develop EV Micro-Climates© Plan**
  - Project Boundaries
  - Incorporates Local Demographic and Transportation Studies
  - Survey of existing EVSE
  - 10-Year EV Infrastructure Feedback
    - Incorporates Stakeholder Feedback
- **Develop EV Micro-Climate© Roadmap (Locations)**
  - Publicly Available Charging Station Installation Detailed Plan
    - Commercial & Public
  - Fast Charger Installation Detailed Plan
  - Home Base Charging Station Installation Detailed Plan
    - Residential/Fleet

THANK YOU FOR ALL YOUR HELP!

More Information

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